UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,946	07/21/2003	Georges Emmanuel Blin	G&C 30566.306-US-01	4627

22462 7590 04/04/2006

GATES & COOPER LLP
HOWARD HUGHES CENTER
6701 CENTER DRIVE WEST, SUITE 1050
LOS ANGELES, CA 90045

EXAMINER	
GOGIA, ANKUR	

ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/623,946	BLIN ET AL.	
	Examiner	Art Unit	
	Ankur Gogia	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,10-12,14-18,21-23,25-29,32-34,36-40,43 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,10-12,14-18,21-23,25-29,32-34,36-40,43 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/3/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Rule 105 Request for Information

1. In response to the Rule 105 Request for Information in the Office Action of November 3, 2005, it was stated that Stone® Disk Arrays v.2 embodied the invention claimed in the instant application. Examiner respectfully requests the following information regarding Stone® Disk Arrays v.1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

2. The examiner respectfully requests any published documents that disclose Stone® Disk Arrays v.1 and the publication date of these documents.

3. In responding to those requirements that require copies of documents, where the document is a bound text or a single article over 50 pages, the requirement may be met by providing copies of those pages that provide the particular subject matter indicated in the requirement, or where such subject matter is not indicated, the subject matter found in applicant's disclosure.

4. The fee and certification requirements of 37 CFR 1.97 are waived for those documents submitted in reply to this requirement. This waiver extends only to those documents within the scope of this requirement under 37 CFR 1.105 that are included in the applicant's first complete communication responding to this requirement. Any supplemental replies subsequent to the first communication responding to this requirement and any information disclosures beyond the scope of this requirement

under 37 CFR 1.105 are subject to the fee and certification requirements of 37 CFR 1.97.

5. The applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where the applicant does not have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained may be accepted as a complete reply to the requirement for that item.

6. This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

7. Examiner acknowledges the amendment dated March 3, 2006 in response to the Office Action dated November 3, 2005.

8. Claims 2, 8-9, 13, 19-20, 24, 30-31, 35 and 41-42 have been cancelled.

9. Claims 1, 10-12, 21-23, 32-34 and 43-44 have been amended.

10. Claims 1, 3-7, 10-12, 14-18, 21-23, 25-29, 32-34, 36-40 and 43-44 remain pending.

11. The instant application has a total of 32 claims pending in the application; there are 4 independent claims and 28 dependent claims, all of which are ready for examination by the examiner.

Response to Amendment

12. Claims 10 and 43 appear to have been amended to depend from claims 1 and 34 respectively however, the strike-through used to delete the text "9" and "42" from the respective claims appears to overlap with the text and therefore, is not easily visible. It is suggested that the text be deleted using double brackets (i.e. [[9]] and [[42]]) in order to make the deletion more clear.

13. With respect to the Rule 105 Request for Information, the response has been received and placed in the record.

14. With respect to the objection to the abstract for use of legal phraseology, the objection is **maintained,** as all instances of the legal phraseology have not been removed. Specifically, line 2 of the replacement abstract recites, "data indicating which of **said** storage elements." Appropriate correction is required.

15. With respect to the objections to the specification, the objections are withdrawn in consideration of the amendments to the specification.

16. With respect to the objection to the title, the objection is withdrawn in consideration of the replacement title.

17. With respect to the rejection of claims 1-11, 20-22, 31-33 and 42-44 under 35 U.S.C. 112, second paragraph, the rejection is withdrawn in consideration of the amendments to the respective claims.

Response to Arguments

18. With regards to the argument that **"Stoppani, Stallings, MSCD, and Bopardikar do not teach, disclose or suggest using a separate cache to store usage information for different partitions on a RAID system,"** the argument has been considered and is not persuasive. In Col. 3, Lines 55-65 Bopardikar discloses a RAID system with multiple partitions for storing image data of different formats (i.e. different frame definitions/sizes). Stoppani, Jr. discloses, in Col. 6, Lines 17-43, a bitmap that is used to keep track of free clusters, of a predetermined size, in a hard disk. Stoppani, Jr. also discloses where each disk in the system has it's own bitmap. Furthermore, Stoppani, Jr. discloses a free space table consisting of information in a cache that stores a summary of the information in the bitmaps, with the free space table containing an entry for each disk in the system. Since a partition can be viewed as a separate disk, the combination of Bopardikar and Stoppani, Jr. discloses using a separate cache for storing usage information for different "partitions" in a RAID.

19. With regards to the argument that **"Stoppani, Stallings, MSCD, and Bopardikar do not teach, disclose or suggest storing information in cache that identifies a predetermined frame/definition size for each separate partition and a number of storage elements in each separate partition not containing image data,"** the argument has been considered and is not persuasive. As discussed above in ¶18, Stoppani, Jr. discloses using a free space table to store information about the free space in hard disks in the system, with each entry in the table being an entry for a different disk. To identify which entry corresponds to which disk, the entry would have an identifier to identify the particular disk. When combined with Bopardikar, the above limitation is disclosed.

20. With regards to the argument that **the system would not operate in the manner disclosed if the data in the system was not image data**, the argument is moot in view of new grounds of rejections.

Information Disclosure Statement

21. As required by M.P.E.P. 609(c), the applicant's submission of the Information Disclosure Statement dated March 3, 2006 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by M.P.E.P. 609(c)(2), a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

Claim Rejections - 35 USC § 112

22. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

23. Claims 1, 3-7, 10-12, 14-18, 21-23, 25-29, 32-34, 36-40 and 43-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1

The limitations "usage data for each of the multiple datastores" in paragraph (b) and "update said usage data in each of said datastores" in paragraph (c)(i) appear to be new matter and have not been disclosed in the specification. The first limitation appears to disclose that the usage data contains usage information about the multiple datastores, however ¶39 of the specification discloses that the usage data stores information on whether the storage elements are being used or not. The specification does not appear to disclose at all that the usage data may be data for the datastores.

The second limitation discussed above, appears to disclose that the usage data is stored in the datastores. However ¶s45-47 of the specification disclose that the datastores contain information about the predetermined frame definition/size and information indicating the number of free storage elements. In other words, the

specification appears to disclose that the datastores contain a summary of the usage data, however the usage data is stored as separate from the datastores.

Claim 12

The limitation "storing usage data for each of the multiple datastores" in ¶3 of claim 12 appears to be new matter and has not been disclosed in the specification. The limitation appears to disclose that the usage data contains usage information about the multiple datastores, however ¶39 of the specification discloses that the usage data stores information on whether the storage elements are being used or not. The specification does not appear to disclose at all that the usage data may be data for the datastores.

Claim 23

The limitation "storing usage data in multiple datastores" in ¶3 of claim 23 appears to be new matter and has not been disclosed in the specification. The limitation appears to disclose that the usage data is stored in the datastores. However ¶s45-47 of the specification disclose that the datastores contain information about the predetermined frame definition/size and information indicating the number of free storage elements. In other words, the specification appears to disclose that the datastores contain a summary of the usage data, however the usage data is stored as separate from the datastores.

Claim 34

The limitation "store usage data in multiple datastores" in ¶3 of claim 34 appears to be new matter and has not been disclosed in the specification. The limitation

appears to disclose that the usage data is stored in the datastores. However ¶s45-47 of the specification disclose that the datastores contain information about the predetermined frame definition/size and information indicating the number of free storage elements. In other words, the specification appears to disclose that the datastores contain a summary of the usage data, however the usage data is stored as separate from the datastores.

For the reasons above, the claims are rejected under 35 U.S.C. 112, first paragraph. For the purposes of prior art, the claims will be interpreted such that the usage data is stored separately from the datastores and the usage data and datastores contain information as disclosed in the specification (i.e. the usage data contains information indicating which storage elements do or don't contain image data and the datastores contain a summary of the usage data).

24. Claims rejected in ¶15 and not specifically addressed above are rejected for inheriting the deficiencies of the claims from which they depend.

25. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

26. Claims 1, 3-7, 10-12, 14-18, 21-23, 25-29 and 32-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims disclose "wherein each of said defined storage elements comprises a separate partition on the RAID" and wherein the datastores contain information "indicating said number of storage elements in each separate partition." It appears that

these limitations are contradictory in that the first limitation discloses that the defined storage elements consist of the separate partitions, however the second limitation appears to disclose that the separate partitions consist of the storage elements. It is unclear whether the partitions are made up of the storage elements or if the storage elements are made up of the partitions.

For prior art purposes, the examiner has interpreted the claims such that the RAID consists of a plurality of partitions with each partition consisting of a plurality of storage elements as is supported by the specification in ¶35. Specifically, the specification discloses wherein a disk is partitioned into three partitions (Fig. 5, 501-503) with each partition consisting of storage elements (Fig. 5, A0, A1, A2, B0, B1, B2, C0, C1, C2 and so on).

27. Claims 11, 33 and 44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, the claims are dependent from cancelled claims. The claims have been interpreted such that claim 11 is dependent from claim 1, claim 33 is dependent from claims 23 and claim 44 is dependent from claim 34. Appropriate correction is required.

28. Claims rejected in ¶18 and not specifically addressed above are rejected for inheriting the deficiencies of the claims from which they depend.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

30. Claims 1, 3, 5-7, 10-12, 14, 16-18, 21-23, 25, 27-29, 32-34, 36, 38-40 and 43-44 are rejected under 35 U.S.C. 103(a) as being obvious over Bopardikar et al. (6,404,975; Hereinafter referred to as Bopardikar) in view of Stoppani, Jr. (5,287,500; Hereinafter referred to as Stoppani), and "Operating Systems Internals and Design Principles" by William Stallings.

Independent Claim 1

Bopardikar discloses a data processing apparatus, comprising:

(a) data storage means comprising a RAID **(Col. 3, Lines 55-65)** having a plurality of defined storage elements, wherein each of said defined storage elements comprises a separate partition on the RAID, with each separate partition configured to accept image data relating to image frames of a predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Bopardikar does not disclose expressly, the data processing apparatus comprising:

(b) memory means containing multiple datastores and usage data for each of the multiple datastores, said usage data indicating which of said defined storage elements contains image data of the predetermined frame definition/size; and

(c) processing means configured to:

(i) update said usage data in each of said datastores in response to image data being stored within said data storage means;

(ii) analyse said usage data to determine the number of said storage elements not containing image data;

(iii) store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition and indicating said number of storage elements in each separate partition not containing image data; and

(v) read the information from said datastore to determine whether further data may be stored.

Stoppani discloses a memory means **(Fig. 1, Item 112; Col. 2, Lines 30-31: Primary memory)** containing multiple datastores **(Fig. 6, Combination of Items 240, 244, 246; Col. 6, Lines 25-28: Each entry in the free space table is a datastore)**. and **a plurality of disks** containing usage data, the usage data indicating the clusters of a predetermined size that do or do not contain data **(Fig. 6, Item 232; Col. 6, Lines 19-24)**; and a processing means **(Fig. 1, Item 124)** configured to update said usage data in each of said datastores in response data being stored within said data storage means **(Col. 6, Lines19-24)**; analyse said usage data to determine the number of said storage elements not containing data **(Col. 6, Lines 35-43)**; store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition **(Col. 6, Lines 25-28)** and indicating said number of storage elements

in each separate partition not containing data **(Col. 6; Lines 38-43)**; and read the information from said datastore to determine whether further data may be stored **(Fig. 4, Step 186; Col 6, Lines 44-47)**.

Bopardikar and Stoppani are analogous art because they are from the similar problem solving area of efficiently allocating storage space in a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Bopardikar and Stoppani before them, to use the free space determination method of Stoppani with the image storage system of Bopardikar.

The motivation for doing so would have been to allow for faster allocation of storage space **(Stoppani: Col. 1, Lines 40-52; Col. 7, Lines 2-5)**.

Therefore, it would have been obvious to combine Stoppani with Bopardikar to obtain the invention as specified in claim 1.

The combination of Bopardikar and Stoppani does not disclose expressly wherein the memory means contains the usage data.

Stallings discloses wherein the usage data is stored in the memory and not the disk **(pg. 549-550)**.

The combination of Bopardikar and Stoppani and Stallings are analogous art because they are from the same field of endeavor of managing storage space on a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of the combination of Bopardikar and Stoppani and

Stallings before them, to store the usage data in the memory means rather than the data storage means.

The motivation for doing so would have been the ability to search for free space without the need for disk access **(Stallings: pgs. 549-550)**.

Therefore, it would have been obvious to combine Stallings with the combination of Bopardikar and Stoppani to obtain the invention as specified in claim 1.

Claim 3

Bopardikar further discloses wherein said data storage means comprises a hard disk **(Col. 3, Lines 55-65)**.

Claim 5

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a bitmap **(Stoppani: Fig. 6 and Col. 6, Lines 19-24)**.

Claim 6

The combination of Bopardikar and Stoppani further discloses wherein said analysis of said usage data comprises parsing said bitmap **(Stoppani: Col. 6, Lines 28-43)**.

Claim 7

The combination of Bopardikar and Stoppani further discloses wherein said datastore comprises at least one cache within the kernel memory of said memory means **(Stoppani: Col. 6, Lines 25-28; an entry of the free space table is being viewed as the "at least one cache". The free space table is within the kernel memory based on the following interpretation by the examiner. On pg. 5, lines**

14-16 of the specification of the instant application, kernel memory is defined as that memory reserved for use by the operating system. In col. 2, lines 33-36 of Stoppani it is stated that the primary memory contains the operating software such as the file system. So the primary memory must also contain the kernel memory and since the free space table is part of the file system, which is part of the operating system, it must be in the kernel memory).

Claim 10

Bopardikar further discloses wherein each said storage element has the storage capacity to store only one of said image frames of said predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Claim 11

The combination of Bopardikar, Stoppani and Stallings further disclose wherein each of said multiple datastores comprises a cache **(Stoppani: Col. 6, Lines 25-28; Stallings pg. 550)**.

Independent Claim 12

Bopardikar discloses a data processing system, comprising RAID data storage means **(Col. 3, Lines 55-65)** having a plurality of defined storage elements, a method of storing data, comprising the steps of:

storing image frames in the RAD data storage means, said RAID data storage means having a plurality of defined storage elements, wherein each of said defined storage elements comprises a separate partition on the RAID, with each separate

partition configured to accept image data relating to image frames of a predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Bopardikar does not disclose expressly, the data processing system comprising processing means and memory means having multiple datastores and the method further comprising the steps of:

storing usage data for each of the multiple datastores within said memory means, said usage data indicating which of said defined storage elements for each partition contains image data of the predetermined frame definition/size; and

analyzing said usage data to determine the number of said storage elements not containing image data;

storing information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition and indicating said number of storage elements in each separate partition not containing image data; and

read the information from said datastore to determine whether further data may be stored.

Stoppani discloses a memory means **(Fig. 1, Item 112; Col. 2, Lines 30-31: Primary memory)** containing multiple datastores **(Fig. 6, Combination of Items 240, 244, 246; Col. 6, Lines 25-28: Each entry in the free space table is a datastore)**. and **a plurality of disks** containing usage data, the usage data indicating the clusters of a predetermined size that do or do not contain data **(Fig. 6, Item 232; Col. 6, Lines 19-24)**; and a processing means **(Fig. 1, Item 124)** configured to update said usage data in each of said datastores in response data being stored within said data storage means

(Col. 6, Lines19-24); analyse said usage data to determine the number of said storage elements not containing data **(Col. 6, Lines 35-43)**; store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition **(Col. 6, Lines 25-28)** and indicating said number of storage elements in each separate partition not containing data **(Col. 6; Lines 38-43)**; and read the information from said datastore to determine whether further data may be stored **(Fig. 4, Step 186; Col 6, Lines 44-47)**.

Bopardikar and Stoppani are analogous art because they are from the similar problem solving area of efficiently allocating storage space in a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Bopardikar and Stoppani before them, to use the free space determination method of Stoppani with the image storage system of Bopardikar.

The motivation for doing so would have been to allow for faster allocation of storage space **(Stoppani: Col. 1, Lines 40-52; Col. 7, Lines 2-5)**.

Therefore, it would have been obvious to combine Stoppani with Bopardikar to obtain the invention as specified in claim 12.

The combination of Bopardikar and Stoppani does not disclose expressly wherein the memory means contains the usage data.

Stallings discloses wherein the usage data is stored in the memory and not the disk **(pg. 549-550)**.

The combination of Bopardikar and Stoppani and Stallings are analogous art because they are from the same field of endeavor of managing storage space on a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of the combination of Bopardikar and Stoppani and Stallings before them, to store the usage data in the memory means rather than the data storage means.

The motivation for doing so would have been the ability to search for free space without the need for disk access **(Stallings: pgs. 549-550)**.

Therefore, it would have been obvious to combine Stallings with the combination of Bopardikar and Stoppani to obtain the invention as specified in claim 12.

Claim 14

Bopardikar further discloses wherein said data storage means comprises a hard disk **(Col. 3, Lines 55-65)**.

Claim 16

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a bitmap **(Stoppani: Fig. 6 and Col. 6, Lines 19-24)**.

Claim 17

The combination of Bopardikar and Stoppani further discloses wherein said analysis of said usage data comprises parsing said bitmap **(Stoppani: Col. 6, Lines 28-43)**.

Claim 18

The combination of Bopardikar and Stoppani further discloses wherein said datastore comprises at least one cache within the kernel memory of said memory means **(Stoppani: Col. 6, Lines 25-28; an entry of the free space table is being viewed as the "at least one cache". The free space table is within the kernel memory based on the following interpretation by the examiner. On pg. 5, lines 14-16 of the specification of the instant application, kernel memory is defined as that memory reserved for use by the operating system. In col. 2, lines 33-36 of Stoppani it is stated that the primary memory contains the operating software such as the file system. So the primary memory must also contain the kernel memory and since the free space table is part of the file system, which is part of the operating system, it must be in the kernel memory)**.

Claim 21

Bopardikar further discloses wherein each said storage element has the storage capacity to store only one of said image frames of said predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Claim 22

The combination of Bopardikar, Stoppani and Stallings further disclose wherein each of said multiple datastores comprises a cache **(Stoppani: Col. 6, Lines 25-28; Stallings pg. 550)**.

Independent Claim 23

Bopardikar discloses a computer-readable medium having computer-readable instructions executable by a computer such that, when executing said instructions, a computer will perform the steps of:

storing data within data storage means comprising a RAID **(Col. 3, Lines 55-65)** having a plurality of defined storage elements, wherein each of said defined storage elements comprises a separate partition on the RAID, with each separate partition configured to accept image data relating to image frames of a predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Bopardikar does not disclose expressly, the computer performing the steps of:

storing usage data in multiple datastores, said usage data indicating which of said storage elements is currently being used in the predetermined frame/definition size;

in response to data being stored within said data storage means, updated said usage data in each of the multiple datastores;

analyzing said usage data to determine the number of said storage elements not containing image data;

storing information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition and indicating said number of storage elements in each separate partition not containing image data; and

reading said information from said datastore to determine whether further image data may be stored.

Stoppani discloses a memory means **(Fig. 1, Item 112; Col. 2, Lines 30-31: Primary memory)** containing multiple datastores **(Fig. 6, Combination of Items 240, 244, 246; Col. 6, Lines 25-28: Each entry in the free space table is a datastore)**. and **a plurality of disks** containing usage data, the usage data indicating the clusters of a predetermined size that do or do not contain data **(Fig. 6, Item 232; Col. 6, Lines 19-24)**; and a processing means **(Fig. 1, Item 124)** configured to update said usage data in each of said datastores in response data being stored within said data storage means **(Col. 6, Lines19-24)**; analyse said usage data to determine the number of said storage elements not containing data **(Col. 6, Lines 35-43)**; store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition **(Col. 6, Lines 25-28)** and indicating said number of storage elements in each separate partition not containing data **(Col. 6; Lines 38-43)**; and read the information from said datastore to determine whether further data may be stored **(Fig. 4, Step 186; Col 6, Lines 44-47)**.

Bopardikar and Stoppani are analogous art because they are from the similar problem solving area of efficiently allocating storage space in a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Bopardikar and Stoppani before them, to use the free space determination method of Stoppani with the image storage system of Bopardikar.

The motivation for doing so would have been to allow for faster allocation of storage space **(Stoppani: Col. 1, Lines 40-52; Col. 7, Lines 2-5)**.

Therefore, it would have been obvious to combine Stoppani with Bopardikar to obtain the invention as specified in claim 23.

The combination of Bopardikar and Stoppani does not disclose expressly wherein the memory means contains the usage data.

Stallings discloses wherein the usage data is stored in the memory and not the disk **(pg. 549-550)**.

The combination of Bopardikar and Stoppani and Stallings are analogous art because they are from the same field of endeavor of managing storage space on a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of the combination of Bopardikar and Stoppani and Stallings before them, to store the usage data in the memory means rather than the data storage means.

The motivation for doing so would have been the ability to search for free space without the need for disk access **(Stallings: pgs. 549-550)**.

Therefore, it would have been obvious to combine Stallings with the combination of Bopardikar and Stoppani to obtain the invention as specified in claim 23.

Claim 25

Bopardikar further discloses wherein said data storage means comprises a hard disk **(Col. 3, Lines 55-65)**.

Claim 27

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a bitmap **(Stoppani: Fig. 6 and Col. 6, Lines 19-24)**.

Claim 28

The combination of Bopardikar and Stoppani further discloses wherein said analysis of said usage data comprises parsing said bitmap **(Stoppani: Col. 6, Lines 28-43)**.

Claim 29

The combination of Bopardikar and Stoppani further discloses wherein said datastore comprises at least one cache within the kernel memory of said memory means **(Stoppani: Col. 6, Lines 25-28; an entry of the free space table is being viewed as the "at least one cache". The free space table is within the kernel memory based on the following interpretation by the examiner. On pg. 5, lines 14-16 of the specification of the instant application, kernel memory is defined as that memory reserved for use by the operating system. In col. 2, lines 33-36 of Stoppani it is stated that the primary memory contains the operating software such as the file system. So the primary memory must also contain the kernel memory and since the free space table is part of the file system, which is part of the operating system, it must be in the kernel memory)**.

Claim 32

Bopardikar further discloses wherein each said storage element has the storage capacity to store only one of said image frames of said predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Claim 33

The combination of Bopardikar, Stoppani and Stallings further disclose wherein each of said multiple datastores comprises a cache **(Stoppani: Col. 6, Lines 25-28; Stallings pg. 550)**.

Independent Claim 34

Bopardikar discloses a computer system programmed to execute stored instructions such that in response to said stored instructions said system is configured to:

store data within data storage means comprising a RAID **(Col. 3, Lines 55-65)** having a plurality of defined storage elements, wherein each of said defined storage elements comprises a separate partition on the RAID, with each separate partition configured to accept image data relating to image frames of a predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Bopardikar does not disclose expressly, the system configured to:

store usage data in multiple datastores, said usage data indicating which of said storage elements contains image data in the predetermined frame/definition size;

in response to data being stored within said data storage means, update said usage data in each of the multiple datastores;

analyse said usage data to determine the number of said storage elements not containing image data;

store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition and indicating said number of storage elements in each separate partition not containing image data; and

read said information from said datastore to determine whether further image data may be stored.

Stoppani discloses a memory means **(Fig. 1, Item 112; Col. 2, Lines 30-31: Primary memory)** containing multiple datastores **(Fig. 6, Combination of Items 240, 244, 246; Col. 6, Lines 25-28: Each entry in the free space table is a datastore)**. and **a plurality of disks** containing usage data, the usage data indicating the clusters of a predetermined size that do or do not contain data **(Fig. 6, Item 232; Col. 6, Lines 19-24)**; and a processing means **(Fig. 1, Item 124)** configured to update said usage data in each of said datastores in response data being stored within said data storage means **(Col. 6, Lines19-24)**; analyse said usage data to determine the number of said storage elements not containing data **(Col. 6, Lines 35-43)**; store information within each of said datastores, said information identifying the predetermined frame definition/size for each separate partition **(Col. 6, Lines 25-28)** and indicating said number of storage elements in each separate partition not containing data **(Col. 6; Lines 38-43)**; and read the information from said datastore to determine whether further data may be stored **(Fig. 4, Step 186; Col 6, Lines 44-47)**.

Bopardikar and Stoppani are analogous art because they are from the similar problem solving area of efficiently allocating storage space in a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Bopardikar and Stoppani before them, to use the free space determination method of Stoppani with the image storage system of Bopardikar.

The motivation for doing so would have been to allow for faster allocation of storage space **(Stoppani: Col. 1, Lines 40-52; Col. 7, Lines 2-5)**.

Therefore, it would have been obvious to combine Stoppani with Bopardikar to obtain the invention as specified in claim 34.

The combination of Bopardikar and Stoppani does not disclose expressly wherein the memory means contains the usage data.

Stallings discloses wherein the usage data is stored in the memory and not the disk **(pg. 549-550)**.

The combination of Bopardikar and Stoppani and Stallings are analogous art because they are from the same field of endeavor of managing storage space on a storage device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of the combination of Bopardikar and Stoppani and Stallings before them, to store the usage data in the memory means rather than the data storage means.

The motivation for doing so would have been the ability to search for free space without the need for disk access **(Stallings: pgs. 549-550)**.

Therefore, it would have been obvious to combine Stallings with the combination of Bopardikar and Stoppani to obtain the invention as specified in claim 34.

Claim 36

Bopardikar further discloses wherein said data storage means comprises a hard disk **(Col. 3, Lines 55-65)**.

Claim 38

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a bitmap **(Stoppani: Fig. 6 and Col. 6, Lines 19-24)**.

Claim 39

The combination of Bopardikar and Stoppani further discloses wherein said analysis of said usage data comprises parsing said bitmap **(Stoppani: Col. 6, Lines 28-43)**.

Claim 40

The combination of Bopardikar and Stoppani further discloses wherein said datastore comprises at least one cache within the kernel memory of said memory means **(Stoppani: Col. 6, Lines 25-28; an entry of the free space table is being viewed as the "at least one cache". The free space table is within the kernel memory based on the following interpretation by the examiner. On pg. 5, lines 14-16 of the specification of the instant application, kernel memory is defined as that memory reserved for use by the operating system. In col. 2, lines 33-36 of**

Stoppani it is stated that the primary memory contains the operating software such as the file system. So the primary memory must also contain the kernel memory and since the free space table is part of the file system, which is part of the operating system, it must be in the kernel memory).

Claim 43

Bopardikar further discloses wherein each said storage element has the storage capacity to store only one of said image frames of said predetermined frame definition/size **(Col. 5, Lines 22-50)**.

Claim 44

The combination of Bopardikar, Stoppani and Stallings further disclose wherein each of said multiple datastores comprises a cache **(Stoppani: Col. 6, Lines 25-28; Stallings pg. 550)**.

31. Claims 4, 15, 26 and 37 are rejected under 35 U.S.C. 103(a) as being obvious over Bopardikar in view of Stoppani, and "Operating Systems Internals and Design Principles" by William Stallings as applied to claims 1, 12, 23 and 34 above and further in view of "Microsoft Computer Dictionary" (MSCD), with MSCD being provided as extrinsic evidence.

Claim 4

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a plurality of data elements, each data element corresponding to one storage element on said data storage means **(Stoppani: Fig. 6 and Col. 6, Lines 19-24; Stoppani discloses a bitmap containing usage data and as is seen in**

MSCD on pg. 61 a bitmap is "a data structure in memory that represents information in the form of a collection of individual bits". Therefore in a bitmap containing usage data the usage data comprises a plurality of data elements (collection of individual bits) with each element corresponding to a storage element on the data storage means).

Claim 15

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a plurality of data elements, each data element corresponding to one storage element on said data storage means **(Stoppani: Fig. 6 and Col. 6, Lines 19-24; Stoppani discloses a bitmap containing usage data and as is seen in MSCD on pg. 61 a bitmap is "a data structure in memory that represents information in the form of a collection of individual bits". Therefore in a bitmap containing usage data the usage data comprises a plurality of data elements (collection of individual bits) with each element corresponding to a storage element on the data storage means).**

Claim 26

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a plurality of data elements, each data element corresponding to one storage element on said data storage means **(Stoppani: Fig. 6 and Col. 6, Lines 19-24; Stoppani discloses a bitmap containing usage data and as is seen in MSCD on pg. 61 a bitmap is "a data structure in memory that represents information in the form of a collection of individual bits". Therefore in a bitmap**

containing usage data the usage data comprises a plurality of data elements (collection of individual bits) with each element corresponding to a storage element on the data storage means).

Claim 37

The combination of Bopardikar and Stoppani further discloses wherein said usage data comprises a plurality of data elements, each data element corresponding to one storage element on said data storage means **(Stoppani: Fig. 6 and Col. 6, Lines 19-24; Stoppani discloses a bitmap containing usage data and as is seen in MSCD on pg. 61 a bitmap is "a data structure in memory that represents information in the form of a collection of individual bits". Therefore in a bitmap containing usage data the usage data comprises a plurality of data elements (collection of individual bits) with each element corresponding to a storage element on the data storage means).**

Conclusion

32. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P. 707.07(i):

a. Per the instant office action, claims 1, 3-7, 10-12, 14-18, 21-23, 25-29, 32-34, 36-40 and 43-44 have received a second action on the merits and are subject of a second action non-final.

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ankur Gogia whose telephone number is 571-272-4166. The examiner can normally be reached on M-F 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 571-272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ankur Gogia
Examiner
Art Unit 2187

3/29/06

DONALD SPARKS
SUPERVISORY PATENT EXAMINER